



I.P.M. in Fruit Trees in Israel



Dr. Miriam Zilberstaine

The target:

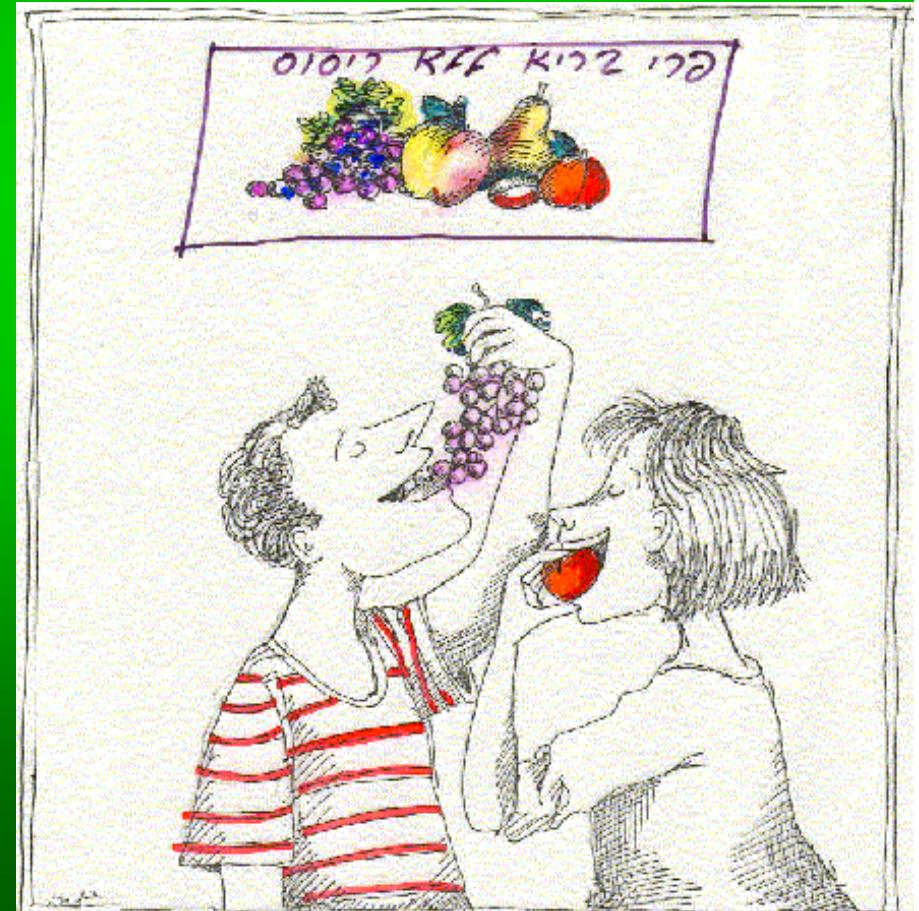


High Quality Fruit

Color, taste, no injuries, **no chemicals**

Friendly management

Economic to the grower



Plant Control Management:

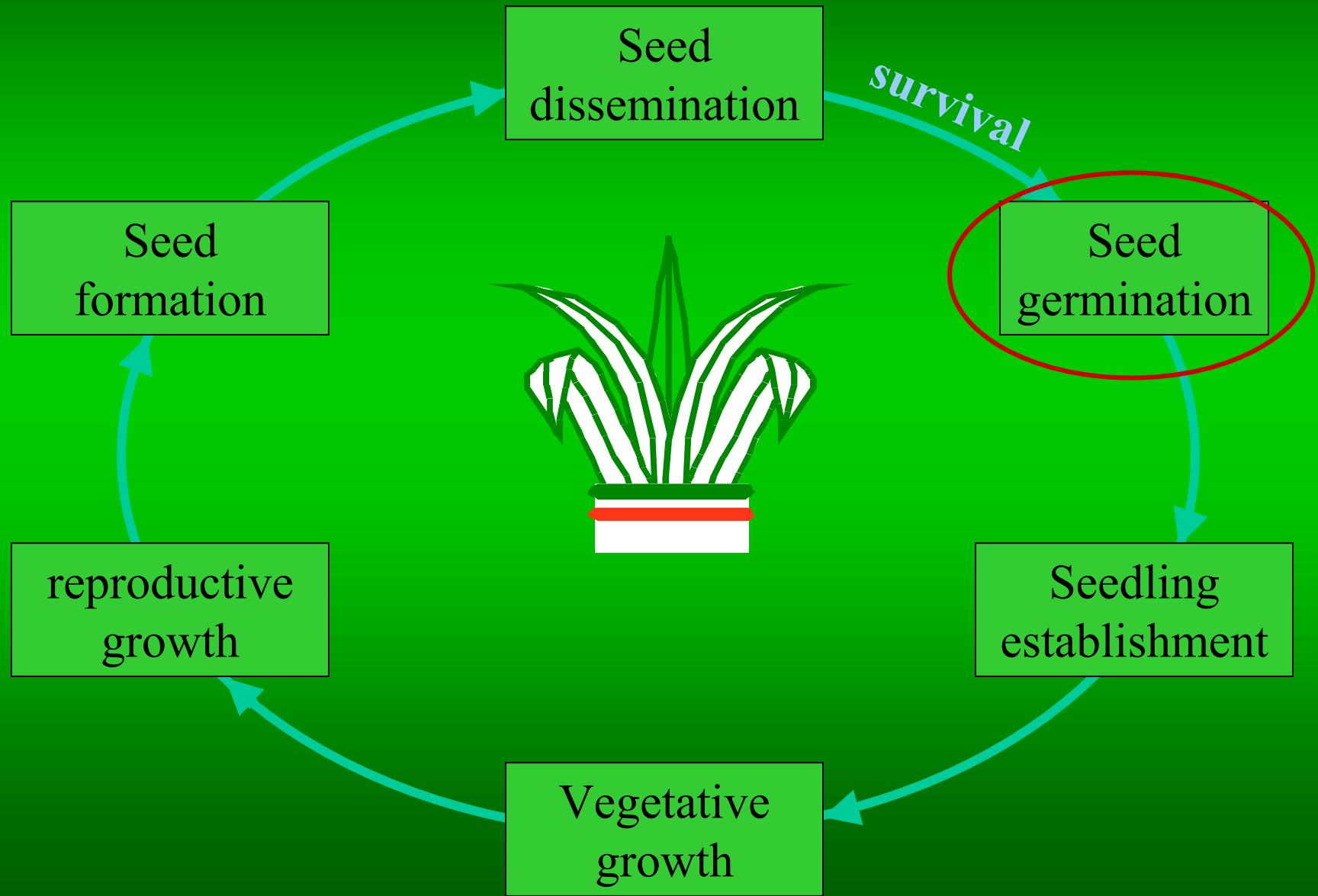
- Conventional control.
- I.P.M. & I.C.M.
- Biological control



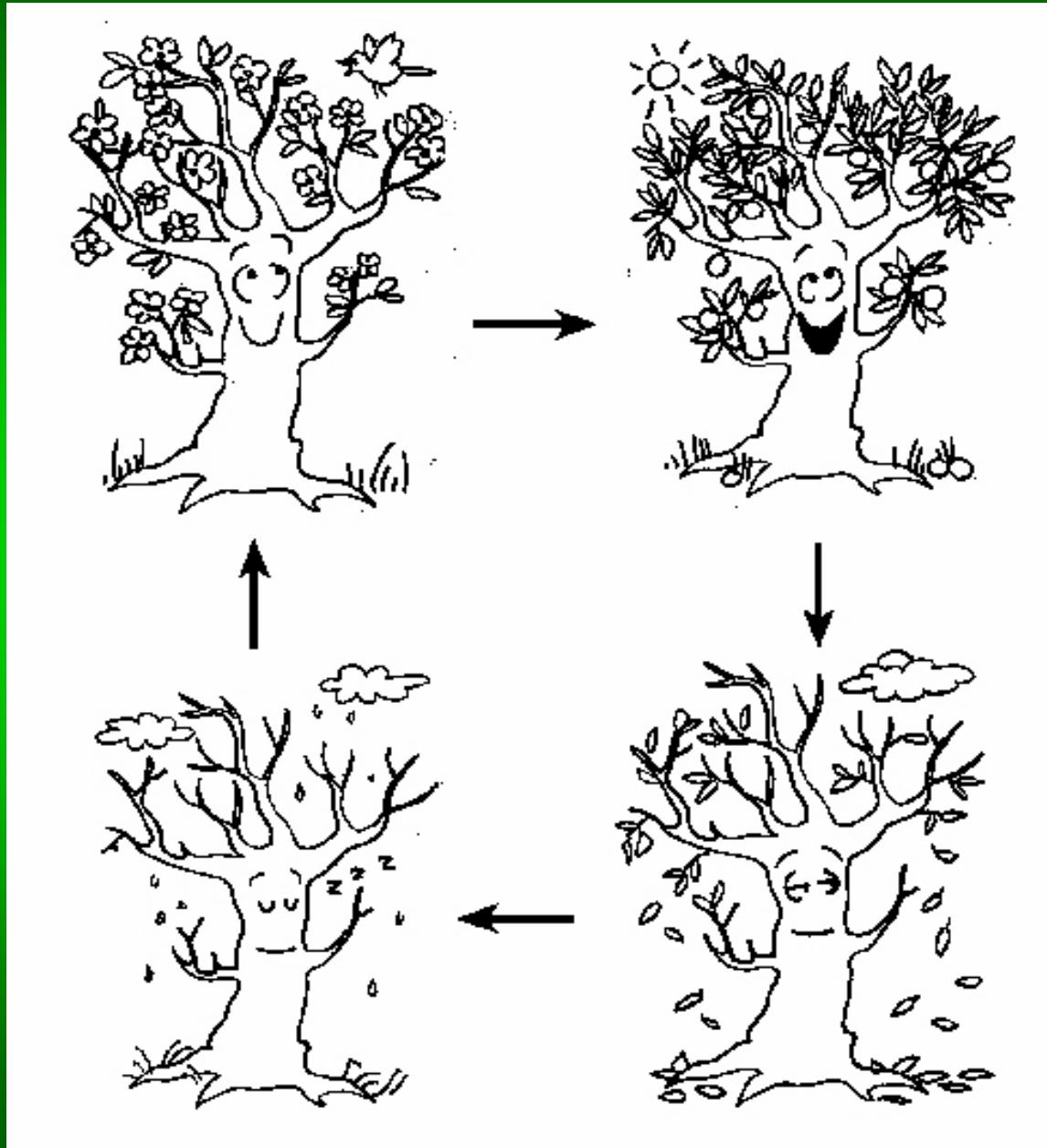
The Principles of Integrated Pest Management - concepts:

- 1. Knowledge about the pests.
- 2. Knowledge about the crop.
- 3. Knowledge about the chemicals.
- 4. A “positive” grower.

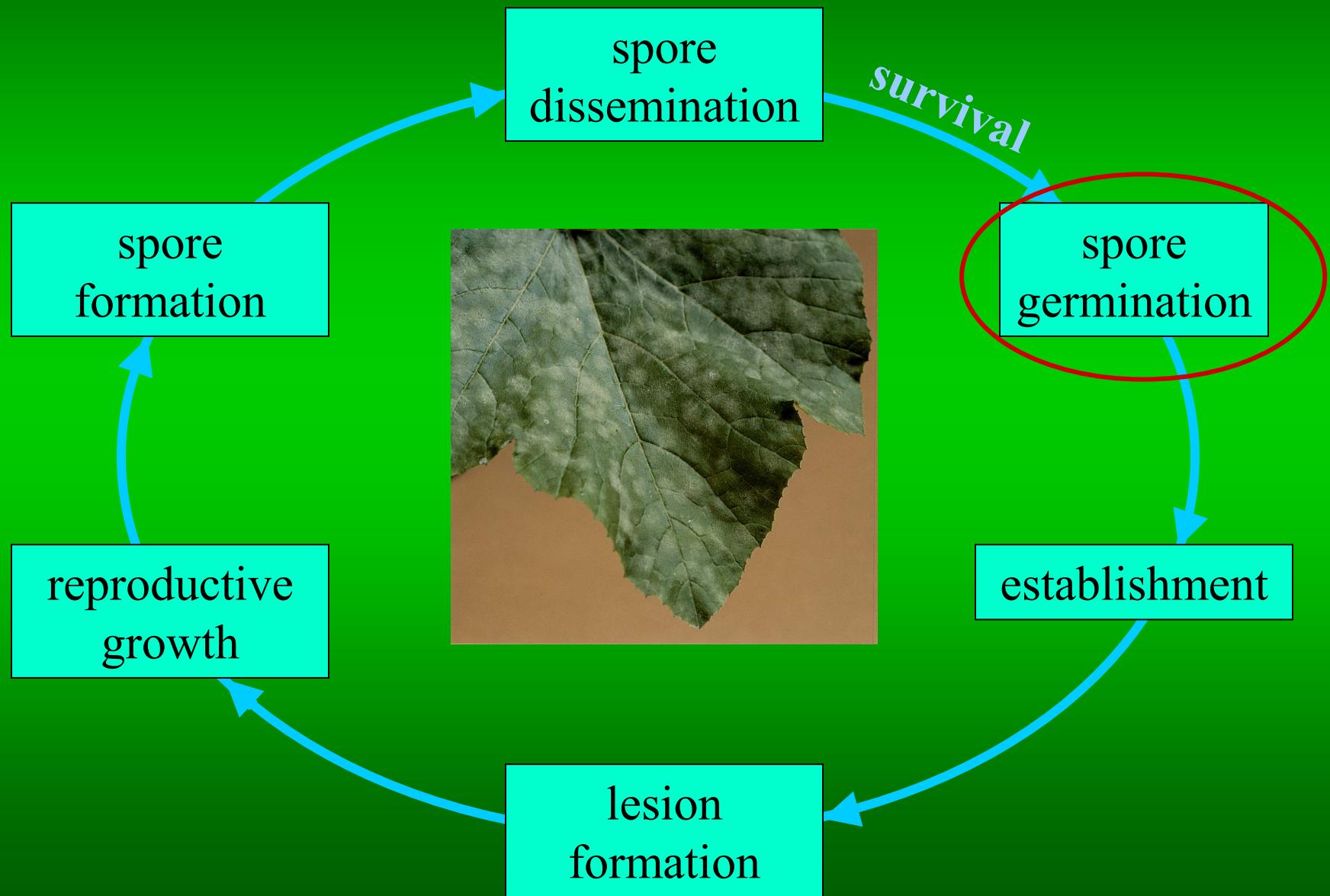
Plant life cycle



Tree life cycle



Pathogen life cycle





“Powder mildew”

**An obligatory
pathogen**

**הנזק לפונדקאי איטי
ומתפתח**

**המורע לרוב מושני צידי
ה策לה**



Powder Mildew symptoms



קימוחון ראשוני בתפוח - פקעי פריחה

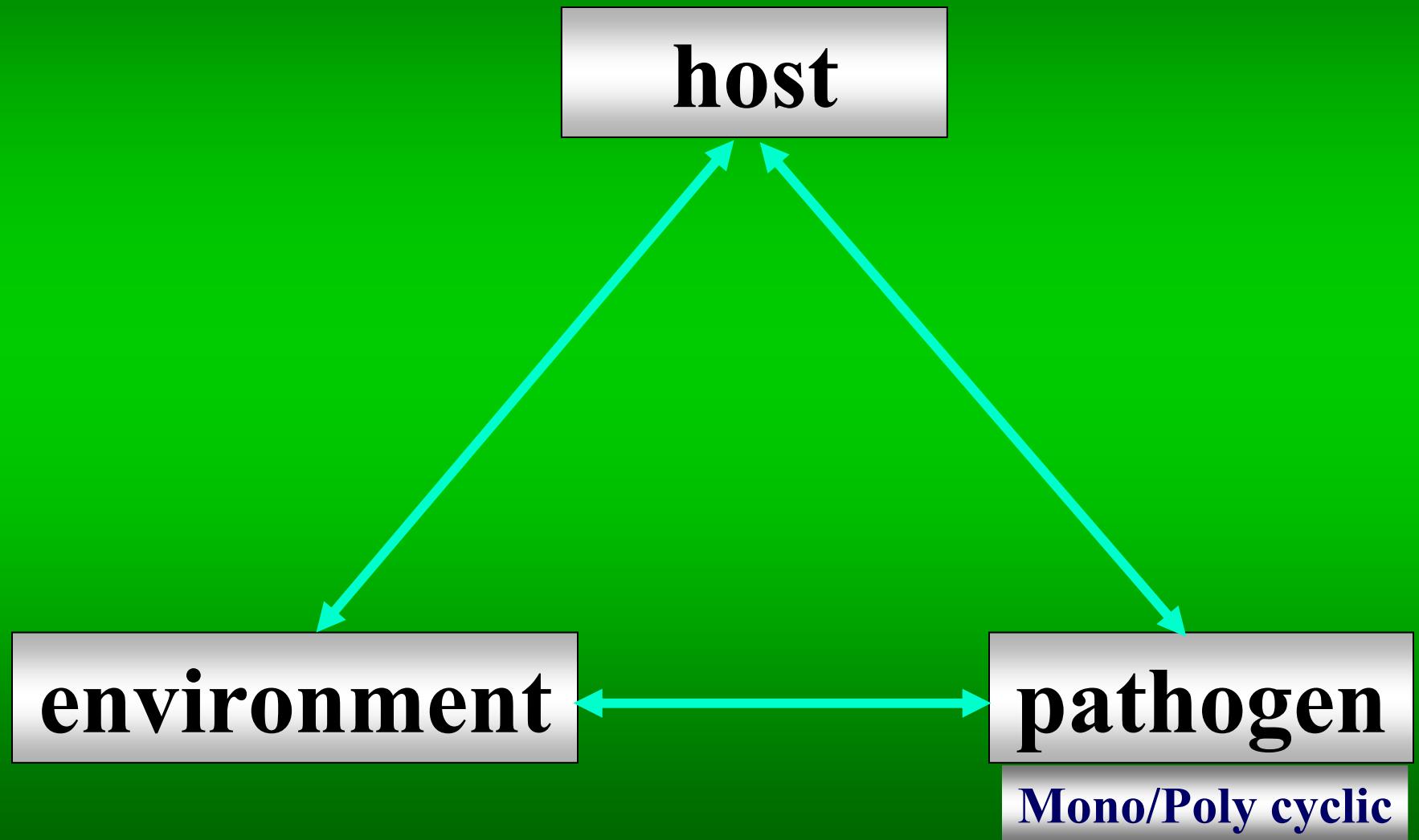


קימחוּ ראשוני בתפוח





The disease triangle



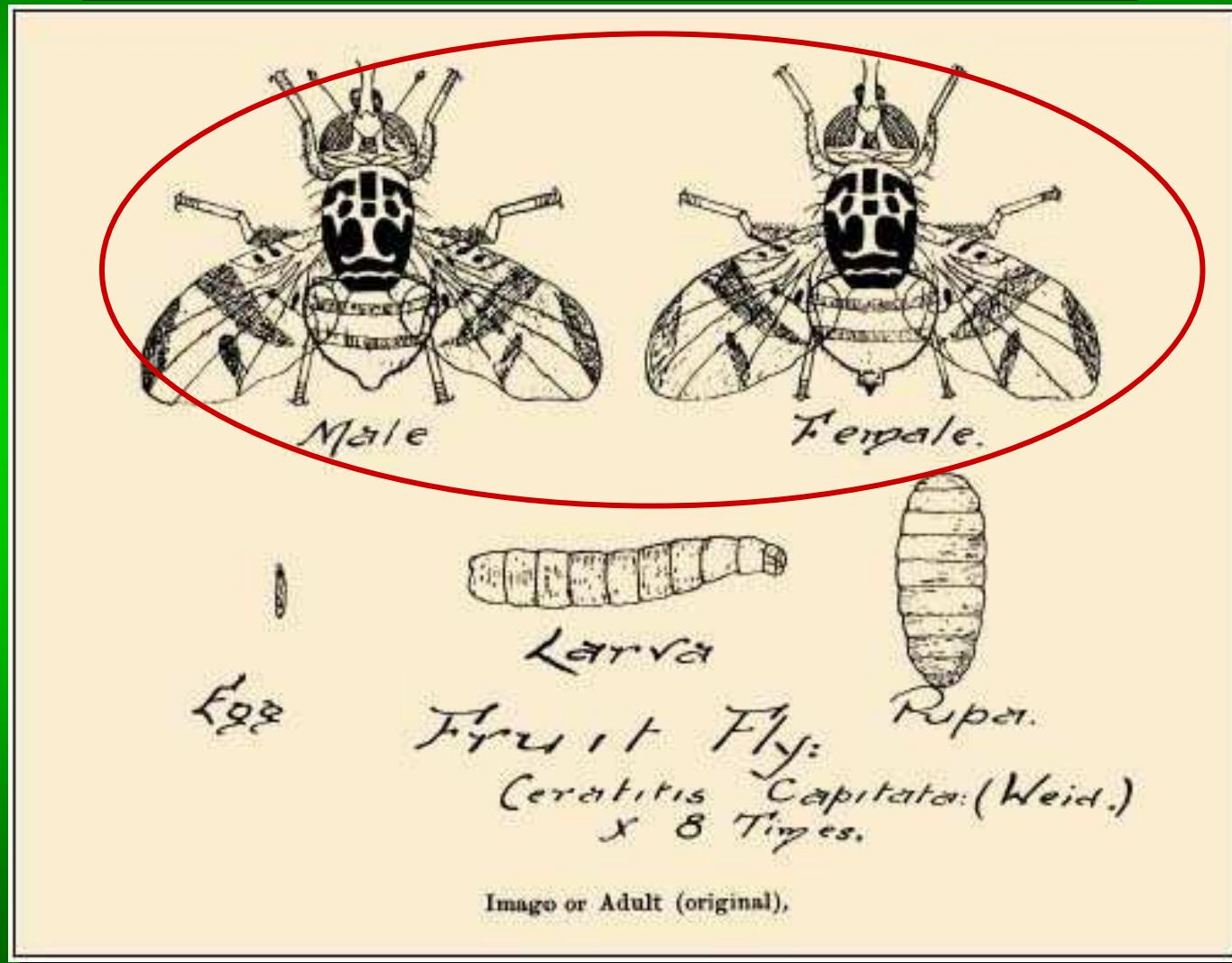
Varieties' Sensitivity

Very sensitive: Grand, Jonatan, Ana

Moderate sensitive: Gala, Grani, Golden

Low sensitive: Delishes, Orliance

Life cycle of the pest



Anarsia



Anarsia



UC Statewide IPM Project
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Anarsia



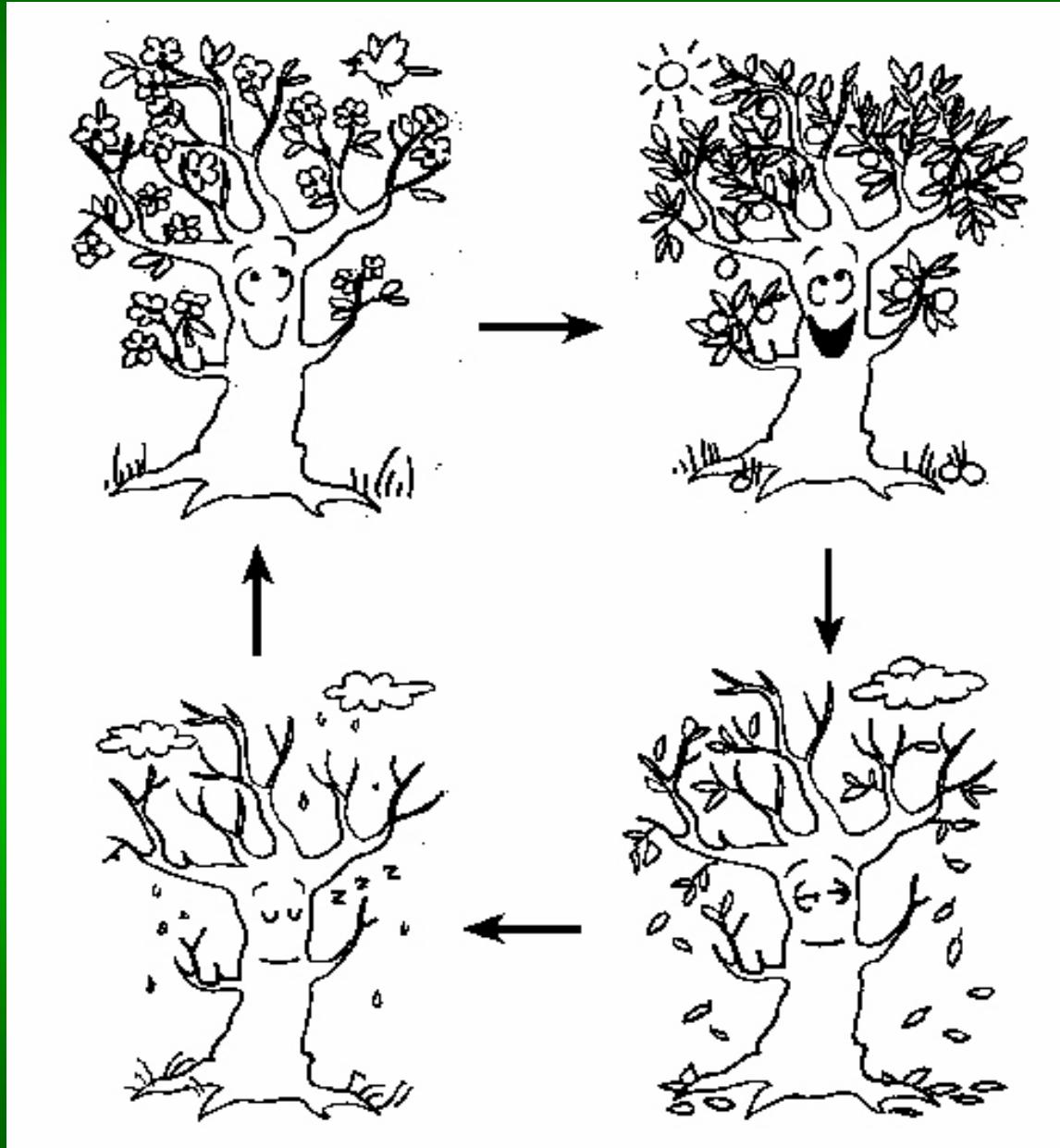
Winter generation



Pupae

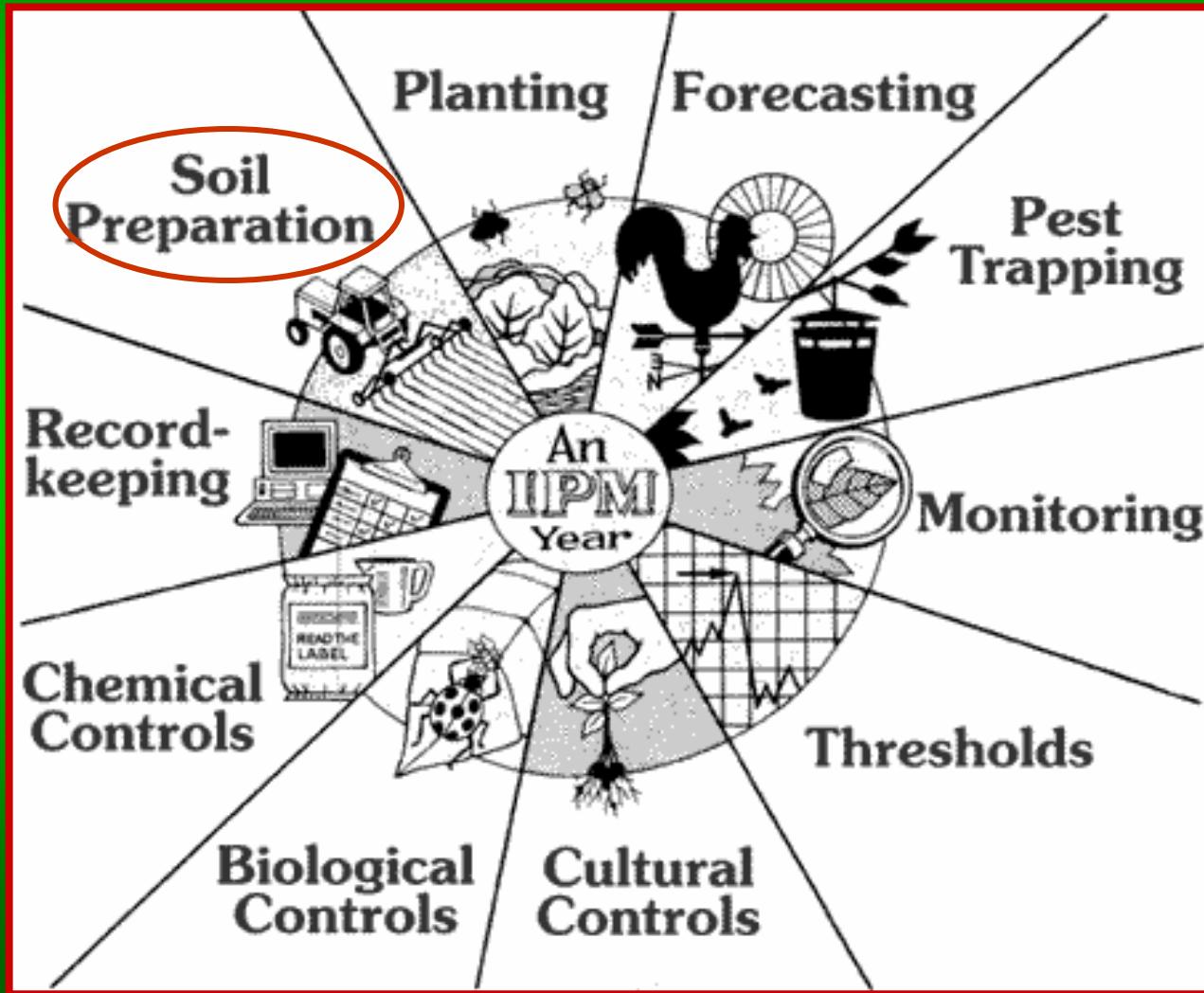


Tree life cycle



Integrated Pest Management

- concepts:





May 1998



Verticillium Wilt on potato





May 2005

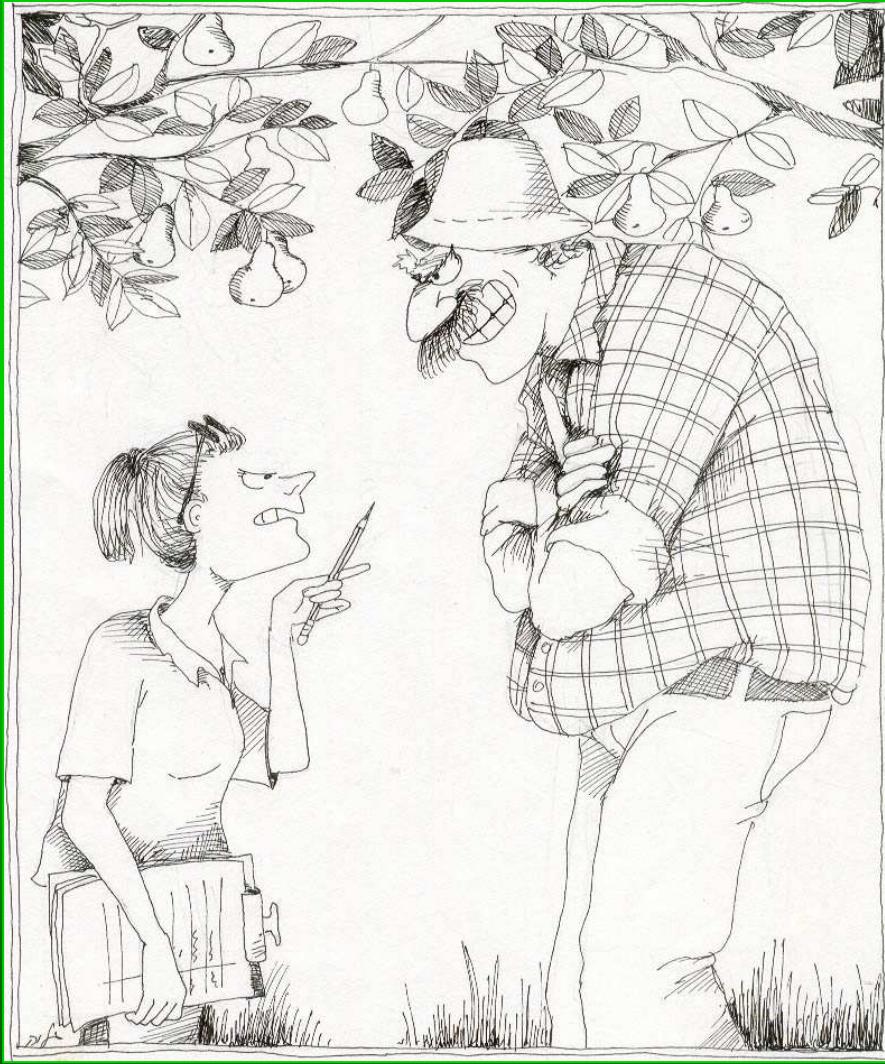


May 2005

The Principles of Integrated Pest Management - concepts:

- 1. Knowledge about the pests.
- 2. Knowledge about the crop.
- 3. Knowledge about the chemicals.
- 4. The “convinced” grower.
- 5. A working system

To treat or not to treat? – this is the question

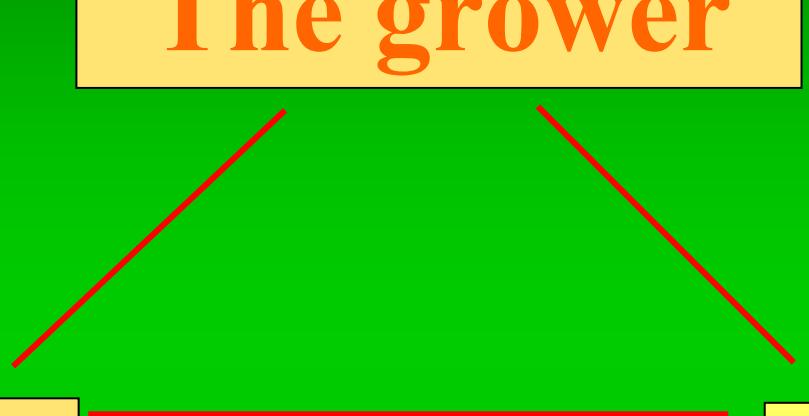


The grower

Supervisor

**Monitor
expert**

The research



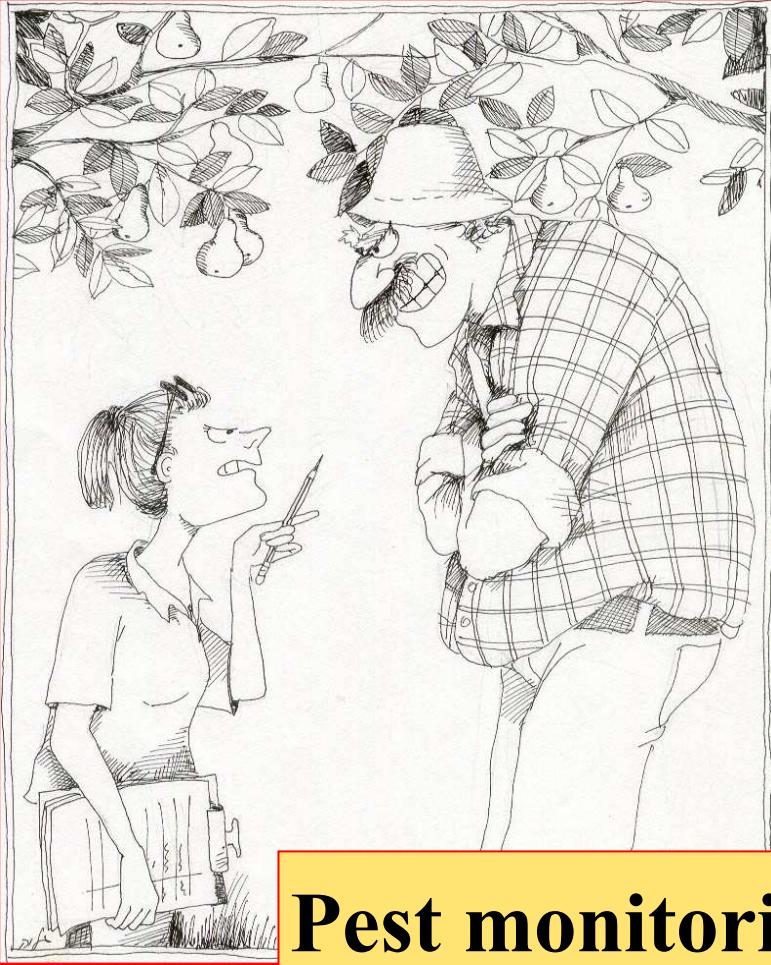
The monitor expert duties:

1. To find the pests and disorders.
2. To inform the farmer and the supervisor the total picture of the field.
3. To controlling the efficacy of the treatments.

A basic principle



Data documenting



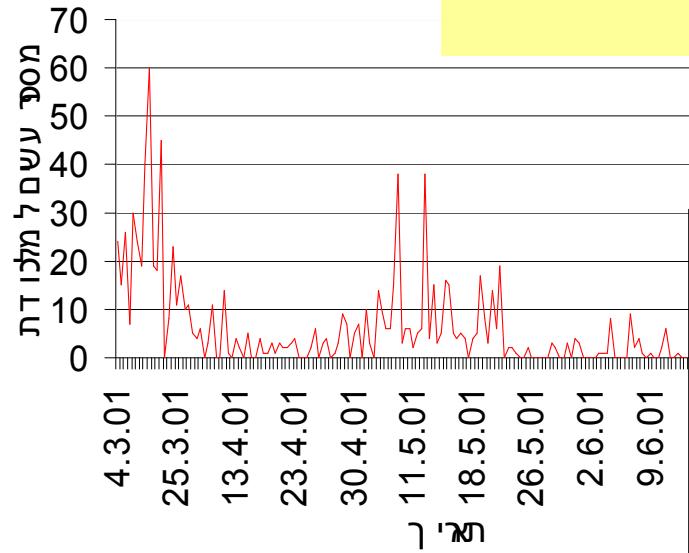
Pest monitoring

The main questions:

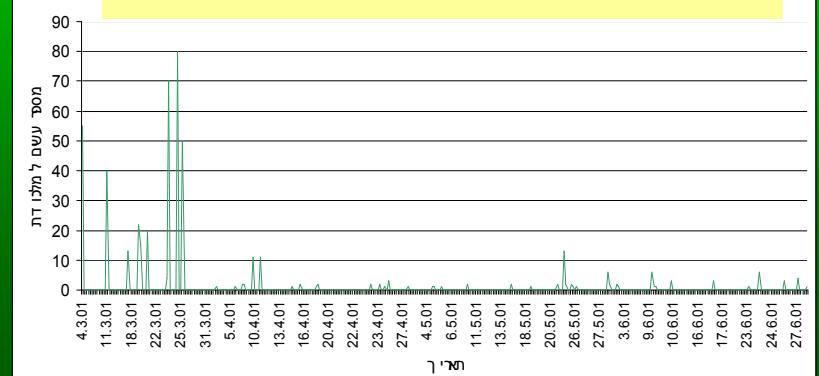
- To monitor each plot or sampling plot???
- What about Niebuhr plots???
- Etc‘

Lobesia botrana (no. of moths / trap)

2001



Cryptoblabes gnidiella



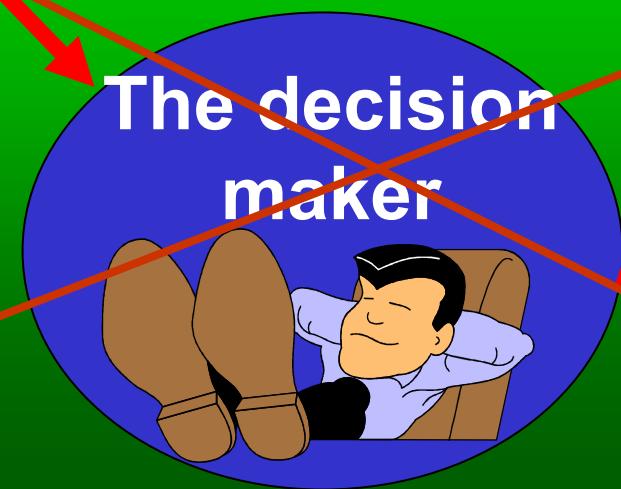
The main questions are:

- * **To treat or not to treat**
- * **When to treat (threshold, phenology)**
- * **Which chemical to use (efficacy, cost, etc')**

The flow of data



The
orchard



The decision
maker



Weather

forecasts

Weather
stations



Data centers

The “friendly” chemicals

Commercial name	Generic name	Inhibition target
Alsystem	Triflumuron	Chitin
demiline	Diflubenzuron	Chitin
Molit	Teflubenzuron	Chitin
Aplord	Buprofezin	G.R.
Insigar	Fenoxy carb	G.R.
Tayger	Phriproxyfen	G.R.

Olive fly



Fruit fly



Mothes

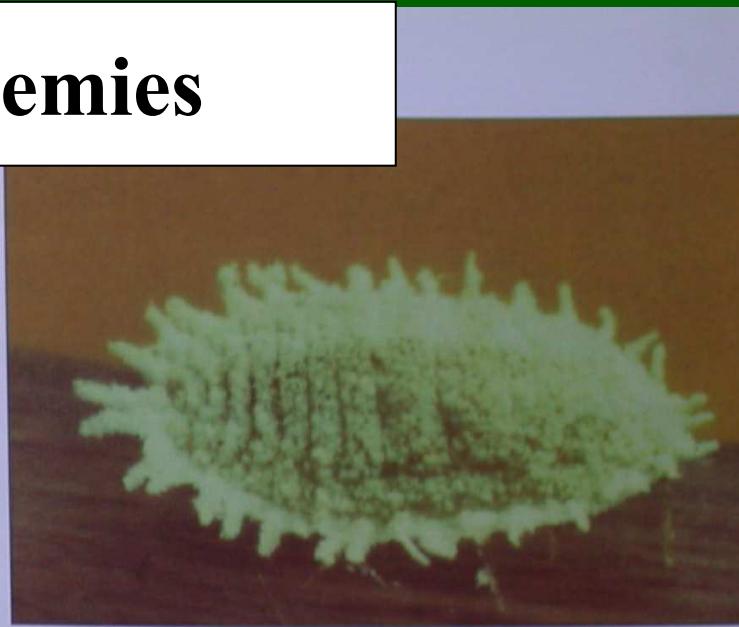
Natural enemies



הכני
male



הצרעה הטפילית העיקרית של הבנימה הקמchia של ההזר
Anagyrus pseudococci: Parasitic wasp



*בנימה הקמchia של ההזר: נקבה בוגרת
Planococcus citri: adult female



כニימות קמחיות שטופלו ע"י אנגירוס - "סומניות"



בנמה הקמchia של ההזר: נזק בפרי צעיר

Horticulture technologies



Insect proof nets

Planning an IPM strategy

Principle



Europe

**IPM in the
province farming**



Israel

**IPM in the
province farming**

Conclusions:

- * Growing friendly fruit is the target
- * Always facing new problems
- * Compulsive professional guidance

In the near future :

Only fruit that would have
cultivated under IPM management
will be accepted in the markets

Is it economics to the farmer??



